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Notice of Allowability

Application No.

10/008,497

Examiner

Dipakkumar Gandhi

Applicant(s)

CORBETT, PETER F.

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/28/2003.
2. ☒ The allowed claim(s) is/are 1-23.
3. ☒ The drawings filed on 13 November 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 11/13/01, 3/25/02, 6/13/02, 5/28/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

ALBERT DECARO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER

DETAILED ACTION***Allowable Subject Matter***

1. Claims 1-23 are allowed.
2. The following is an examiner's statement of reasons for allowance:

The present invention relates to a method and apparatus for providing a technique for efficiently reconstructing any one or combination of two failing storage devices of a storage array. The claimed invention (independent claims 1, 12, 19, 22) recites features such as: "...storage of more than one parity block per stripe on a storage device of the array; each stripe contains a first number f_1 of parity blocks from a second number f_2 of parity storage devices of the extended array; storing data blocks on a third number n of data storage devices; wherein f_1 times f_2 equals n ."

The prior arts of record teach (Baylor et al. US 5,862,158 is an example of such prior arts) a method for storing redundant information in an array of data storage devices such that data is protected against two simultaneous storage device failures. The method assigns each data block to two different parity sets, each protected by a different parity block (abstract, Baylor et al.). Baylor et al. also teach that each storage device is divided into multiple data blocks of the same size. Each storage device is divided into a set of data stripes, where one data stripe from each storage device will together form data band. A parity set is a set of data blocks along with a single parity block such that each of the data blocks and the parity block are resident on a different storage device in the same data band (col. 2, lines 3-4, lines 10-15, Baylor et al.). The prior arts, however, do not teach storing more than one parity block per stripe on a single device of the array; each stripe contains a first number f_1 of parity blocks from a second number f_2 of parity storage devices of the extended array; storing data blocks on a third number n of data storage devices; wherein f_1 times f_2 equals n . Hence the prior arts of record do not anticipate nor render obvious the claimed inventions. Thus the independent claims 1, 12, 19 and 22 are allowable over the prior arts of record. Claims 2-11, 13-18, 20-21 and 23 are allowed because of the combination of additional limitations and the limitations listed above.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dipakkumar Gandhi whose telephone number is 703-305-7853. The examiner can normally be reached on 8:30 AM - 5:00 PM.

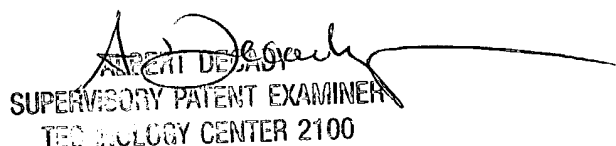
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dipakkumar Gandhi

Patent Examiner



ALBERT DECADY
SUPERVISORY PATENT EXAMINER
TEC. BIOLOGY CENTER 2100